A-105
Cantor, Fitzgerald
105 P SP-1

DRAWING NUMBER
91051

IF THIS DRAWING IS NOT 24"x36" IT IS A REDUCED PRINT SCALE ACCORDINGLY

ELECTRICAL SPECIFICATIONS

CODES AND STANDARDS

The electrical installation shall comply with the following codes and standards:

1.Underwriter's Laboratories Inc.- U.L.
2.National Electrical Code of the NFPA - NEC
3.New York, N.Y. Electric Code
4.Occupational Safety and Health Act- OSHA

SHOP DRAWINGS AND CATALOG CUTS

The Contractor shall prepare and submit to the Engineer for approval, detailed shop drawings, catalog cuts and wiring diagrams in accordance with the requirements of the clause entitled "Working drawings and Catalog Cuts and Brochures"

Shop drawings will be required for the following
1.
2.
3.

Wiring Diagrams will required for the following.
1.
2.
3.

Catalog Cuts will be required for the following
1
2.
3.

SUBSTITUTIONS

Any substitution to the electrical items described on this contract will only be permitted upon written approval of the Engineer.

QUALITY ASSURANCE

The Contractor shall have had experience on at least two projects involving quantities and complexities at least equal to those required under the electrical portion of this contract. All workmen shall be skilled in the trade involved

INSPECTION

All stages of the installation shall be inspected for compliance with the requirements of the contract drawings and specifications. Replace any portion of the construction that does not meet such requirements, to the satisfaction of the Engineer

CUTTING AND PATCHING

1. All cutting and patching required for equipment included in these specifications shall be done by this Contractor. If cutting is done due to failure to perform preliminary roughing work, this Contractor will be responsible for the cost of the additional patching.
2. In those portions of the building where new floors, walls, or partitions are required to be constructed, the Contractor shall furnish and locate all required sleeves and inserts before the floors, walls, or partitions are constructed. Where sleeves and inserts were not installed, or were incorrectly located, the Contractor shall be responsible for the cost of any required cutting and patching.
3. All floor drilling above or adjoining occupied tenant spaces or public spaces shall be performed at times approved by the Engineer.
4. This Contractor shall not do any cutting that may impair the strength of the building construction. No holes, except for small screws, may be drilled in beams or other structural members without obtaining prior approval. All work shall be done in a neat manner by mechanics skilled in their trades and as approved.
5. All penetrations are to be sealed so as to provide a fire rating which meets or exceeds the rating of the partition. △1

DISSIMILAR METALS

1. Dissimilar metals as used herein shall be those which are incompatible in the presence of moisture, as determined from their position in the electrochemical series or from test data. Where dissimilar metals come in contact, paint the joint both inside and out with approved paint so as to exclude moisture from the joint, or provide a suitable barrier separating the metals.
2. Transitions in conduit from one metal to a dissimilar metal shall only be made at boxes or other enclosures, except where otherwise specified herein or shown on the contract drawings

RACEWAYS AND BOXES

1. Where sizes of raceway or boxes are not indicated, the contractor shall contact the engineer for additional details and specifications.
2. Flexible metal conduit shall be used for final connection of lighting fixture and wiring devices to be installed in hung ceilings or in removable hollow metal partition construction. When designated by engineer on final approved tenant drawings, flexible metal conduit shall be used for final connection of lighting fixture and wiring devices to be installed in movable walls and movable partitions. Flexible metal conduit shall be used in such designated movable walls and movable partitions at no additional cost to the Authority.
3. All metal conduit and tubing shall be cut square and reamed at the ends. Red lead shall be applied to all exposed threads after joints have been made up clean and tight.
4. Conduit and tubing runs shall be mechanically and electrically continuous from service starting to all outlets. Conduit shall enter and be securely connected to cabinet, junction box, pull box or outlet box by means of locknuts on the outside and inside and an insulated bushing on the inside. In tubing or flexible metal conduit the one compression locknut shall be made wrench tight. All locknuts shall be the bonding type with sharp edges for digging into the metal wall of the enclosure and shall be installed in a manner that will assure a locking and electrically continuous installation.Locknuts and bushings will not be required where conduits are screwed into tapped connections.
5. All vertical runs of conduit or tubing terminating in the bottoms of wall boxes or cabinets, or similar locations, shall be protected from the entrance of foreign material prior to the installation of conductors.
6. Unless otherwise specified, all conduit and tubing shall be installed concealed. In general, all conduit and tubing shall be run in hung ceilings and furred spaces where they exist. Where conduit is run exposed it shall be securely supported with zinc coated malleable iron pipe straps or other approved metals.
7. Every conduit system shall be installed complete before any conductors are drawn in. Wire pulling lubricants, when utilized, shall be in accordance with the requirements of Underwriters Laboratories Inc. applicable to the specific conductor or cable insulation and raceway material.
8. Where required, and approved by the Engineer, extra deep or extra shallow outlet boxes shall be used to facilitate the installation of the conduit system.

OUTLET DEVICES

1. All device plates for wall outlets (Power and Telephone) shall be brushed satin finish anodized aluminum. Device plates for telephone outlets shall contain a bushed hole.
2. All convenience type receptacles shall be of the grounding type.

GROUNDING

1. Metal raceways, metal enclosures of electrical devices and equipment, lighting standards and other equipment shall be completely grounded in an approved manner.

2. Proper hardware required for complete grounding system, shall be installed by the Contractor.

FASTENERS

Provide inserts, expansion shield lugs, anchors, bolts with nuts and washers, shims or any other type of fastening devices required to fasten panels or other equipment to foundations, floors, walls or ceiling. Unless otherwise specified herein or shown on the contract drawings, all fasteners shall be hot-dipped galvanized and of sizes and types recommended by the equipment manufacturer and as approved by the Engineer.

WIRES

1. Unless otherwise specified or specifically indicated on the drawings, all conductors for lighting and power shall be tinned single conductor annealed copper with type XHHW-VW-1 (low smoke, low toxicity) insulation, 600 volt and a minimum of 98 percent conductivity. (U.L. Standard #44)
2. In lieu of a separate green grounding wire and grounding bushings, flexible metallic raceway for connection of lighting fixtures may be utilized as the grounding conductor if a locking type construction shakeproof connector especially designed to insure positive grounding is provided.

Color coding

The Contractor shall match the color coding that is being used in the building-any deviation due to limited quantities of cable may be permitted upon written approval of the Engineer.

System Voltage

120/208V	Phase	277/480V
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green

Connections

△1 The wiring for lighting, receptacles including outlets for miscellaneous devices and for electric power, including all 120/208V connections into the cellular floor systems shown on the drawings, shall be furnished and installed complete from point of service connection to all outlets indicated on drawings.

CABLE SPLICING

1. No splices or joints will be permitted in either feeders or branches except at outlets or accessible terminals, splice or junction boxes.
2. All materials required for making splices and/or terminations shall be supplied in complete kits- not older than 6 months- the Contractor shall also be responsible to insure that all materials furnished will not adversely effect the physical or electrical properties of any other, or of the wire or cable itself. Kits shall be manufactured by Mac Prod. Inc, Kearny, N.J. or approved equal.
3. Where the Contractor makes connections to existing wires, he shall open and disconnect the existing splices from such wires and install new splices to include the existing as indicated.
4. All splices for wire sizes #10 and smaller shall be made with insulated spring connectors applied to twisted conductors. Two half lapped layers of vinyl tape extending a distance of not less than one inch from the connector shall be applied. Splices other than the aforementioned, will be permitted at the discretion of the Engineer.

LIGHTING FIXTURE HOOKUP WIRE

1. Splice shall not be permitted in any run of fixture hookup wire.
2. Connections to branch circuit conductors and to existing fixture wiring shall be made and installed spring connectors or crimp type connectors.

IDENTIFICATION OF WIRES

1. All wires shall be identified by circuits in all cabinets, boxes, wiring troughs and other enclosures, and at all terminal points, i.e., receptacles, etc.
2. The circuit designations shall be as shown on the contract drawings, or as directed by the Engineer. Tags shall be attached to wires so that they will be readily visible.
3. Brady, B-500 vinyl cloth wire and terminal markers shall be used for all wire identification.

LIGHTING FIXTURES

General

1. This clause of the Specification covers the furnishing of labor, materials, equipment and the installation of all indoor and outdoor lighting fixtures, lighting equipment and the installation of lamps for all the electrical outlets in the building, including the connection of fixtures and equipment to the electric wiring system as shown on plans. As specified hereinafter, certain fixtures shall be furnished by this Contractor while others will be furnished by the Authority for storage, installation and connection by this Contractor.
2. The Contractor is directed to review the applicable Architectural and Electrical drawings for details on fixture construction and installation media for fixtures to be furnished by the Authority. The drawings represent a concept, not a final design, and reasonable changes to design may be made by the Authority.
3. All luminaries and lighting equipment shall be delivered to the premises complete, including all mounting accessories and components necessary for the proper operation of the equipment exclusive of lamps, whether furnished by the Contractor or by the Authority.
4. All fixtures and components shall be made in accordance with the National Electrical Code, all local codes applying and shall conform to all applicable requirements of the Underwriter's Laboratories, Inc.
5. All recessed fixtures furnished by the Authority will be furnished with fixture wiring only. The Contractor shall provide wiring extensions in flexible conduit and necessary fittings to complete the wiring system connections.

LAMPS

Lamps shall be those manufactured by General Electric, Westinghouse, or Sylvania. All fluorescent lamps shall be warm white-watt miser where applicable. Incandescent lamps shall be rated at 125 volts except where otherwise noted.

The Contractor shall install new lamps in all new fixtures and fixtures that are supplied by the Authority. The Authority can supply fluorescent lamps for base building type fixtures only. All other lamps shall be furnished by the Contractor "Supplied by" shall mean "may be purchased from."

Prior to acceptance and final payment, all lamps which are missing, burnt-out or broken shall be furnished or replaced by the Contractor.

Installation and locating of fixtures

Fixture locations as indicated on the electrical drawings are generalize and approximate. The Contractor shall carefully verify fixture locations with Architectural plans, reflected ceiling plans and other reference data prior to installation.

Wiring

1. Wiring between fluorescent lampholders and associated operating and starting equipment shall be of the same or heavier gauge than the leads furnished with the approved types of ballasts and shall have equal or better insulating and heat-resisting characteristics. All other wiring within fluorescent lighting fixtures or from the fixture to the splice with the building wiring shall conform to the requirements of the latest published issue of the National Electrical Code.
2. Unless otherwise specified or shown on drawings, all wiring in conjunction with incandescent fixtures shall conform to the requirements of the latest issue of the National Electrical Code and shall be not less than No. 16 Gauge. Wiring shall be protected with tape or tubing at all points where abrasion is likely to occur. Wiring shall be concealed within fixture construction, except where the fixture design or mounting dictates otherwise.
3. Connections of wires to terminals of lampholders and other accessories shall be made in a neat and workmanlike manner and shall be electrically and mechanically secure with no loose strands protruding. The number of wires extending to or from the terminals of a lampholder or other accessory shall not exceed the number which the accessory is designed to accommodate.
4. Joints in wiring within lighting fixtures and connections of the fixture wiring to the wiring of the building shall be so spliced that they will be mechanically and electrically secure and then soldered and taped to provide insulation equal to that of the conductors being joined. In lieu of solder and tape, approved types of adequately insulated solderless pressure crimped type connectors may be furnished, provided sizes used, method of application and tools employed are in accordance with the connector manufacturer's recommendations.
5. Wiring channels and wireways shall be free from projections and rough and sharp edges throughout, and all points or edges over which conductors must pass and may be subject to injury or wear shall be rounded or bushed. Insulated bushings shall be installed at all points of entrance or exit of flexible wiring.

Fluorescent Lamp Ballasts

1. Ballasts shall provide and assure safe and reliable operation of the particular fluorescent lamp(s) specified for each fixture type. Ballasts shall be of high power factor type, rated class 'P', series or maxi-miser where applicable-sequence for operation of Rapid Start Lamps.
2. The ballast shall be protected by a minimum of a one year guarantee starting from the date of acceptance of the installed fixtures, against defects in workmanship and material which includes an in-warranty service program providing for the payment of authorized labor charges incurred in the replacement of inoperative in-warranty ballasts.
3. All ballasts shall be U. L. listed Class "P".

SUPPORTS

1. Recessed fixtures shall be furnished complete with mounting devices and accessories. Where necessary to meet code requirements, enclosure housings shall be suitable for a 1 hour fire rating or concrete pour requirements. Attachment devices including brackets, plaster rings, saddle hangers, and tie bars shall be made of formed or rolled metal shapes with the requisite rigidity and strength to maintain continuous alignment of the installed fixtures.
2. Fixtures shall be attached to ceiling supporting members and shall not depend on lathing or plaster for alignment or support. Fixtures in suspended ceiling shall be supported by saddle hangers or tie bars attached to runners or between crossbars of ceiling systems. Mounting splines or other positive means of maintaining alignment and rigidity shall be provided. Supporting members shall be surface passivated, and shall be primed or paint dipped to resist corrosion. Fastening devices shall be of a positive, locking type, and shall not require the use of special tools to apply or to remove. Tie wires shall not be used in place of fastening devices

FINAL CLEAN-UP AND FIELD TESTS

After completion of the entire electrical installation:

1. The Contractor before final acceptance will be granted, shall clean all lighting fixtures, glassware, panelboards, cabinets, device plates, service fittings and other items furnished under this contract, and shall insure that all directories are in place with completed or revised schedules and all identification or markings of equipment, cables, and other items, are completed.
2. The Contractor shall repair or replace, as directed by the Engineer, at no additional cost to the owner, any item damaged due to installation, relocation or reinstallation.
3. In addition to any tests that may be required in the various other disciplines, perform field tests in the presence of the Engineer, to demonstrate the reliability of the electrical installation. Give the Engineer 48 hours advance notice of such tests. The following field *tests shall be performed by the Contractor*:
   a. Operate all electrical equipment for a period of 24 hours, unless otherwise directed by the Engineer.
   b. Test all wires and cables installed under this contract with a 1000 volt Megohmeter. Furnish the Engineer a copy of the results together with an outline of the method used. If in the opinion of the Engineer, any readings are lower than required by good practice or applicable codes promptly replace the equipment or materials involved.
   c. Should the foregoing tests reveal any defects, promptly correct the defects and re-run such tests until the entire installation is satisfactory in all respects.

POWER INTERRUPTION NOTE

Electrical power must be shut off prior to the Contractor performing any work in raceways with live electrical circuits or on any other live electrical circuits or equipment. Power interruption will be permitted only between the hours of 6 P.M. and 8 A.M. The actual dates, time and duration of all power interruptions shall be subject to prior approval of the Engineer.

CORE DRILLING

Core drilling will be permitted only between the hours of 6 P.M. and 8 A.M.

NOTES

1. All floor outlets to be removed or abandoned shall have all wires removed back to the panel or header duct & the afterset fitting removed. A metal slug shall be installed to cap the P/T cell. The existing cored hole shall be repaired as per the latest PA specifications and filled with concrete adjusted to grade.

2. The Contractor shall install in all afterset fittings two (2) "Palusol" packets (firestop), one on each side of the afterset baffle. Packets can be purchased from the Authority and installed by the Contractor.

JUSTIN PC ARCHITECTS
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JOHN C. WESTRICK & ASSOCIATES
CONSULTING ENGINEERS
2110 MAPLE AVE. SOUTH PLAINFIELD, N.J.
07080 201 561-4170

DATE	ISSUED TO	PR.	TR.
3/22/91	PORT AUTHORITY FOR APPROVAL	10	1
3/22/91	CFSC FOR RECORD CONTRACTORS FOR BIDDING	5 4	4
5/3/91	P.A. FOR APPROVAL	10	–
5/30/91	P.A. FOR APPROVAL	6	1
6-19-91	PORT AUTHORITY	10	–
10-21-91	P.A. AS BUILT DRAWING	–	1

JOHN C. WESTRICK & ASSOCIATES
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SOUTH PLAINFIELD, N.J. 07080
561-4170

AS BUILT DRAWINGS

Signature _______ Date _______

NO	DATE	REVISION	BY
1	4-29-91	REVISED AS PER. PA COMMENTS	PE

CANTOR, FITZGERALD SECURITIES CORP.
105TH FLOOR
ONE WORLD TRADE CENTER NEW YORK N.Y.

PROPOSED NEW TRADING ROOM
FOR INVESTMENT STRATEGIES
ELECTRICAL SPECIFICATIONS

NORTH

PROJECT NO 91115
SCALE NONE
DRAWN BY MAC
CHECKED BY JCW
DATE 3-20-91

DRAWING NO
105P E-1

PHASE
P
T.A.A. NO.

JOHN C. WESTRICK
054052